CLAIMS

1. A thin film transistor substrate comprising:

a plurality of electrode pads disposed on end portions of gate and data lines arranged on a substrate; and

a conductive bump including a protrusion member disposed on the electrode pad with a predetermined thickness and a conductive coating layer disposed on the protrusion member to be electrically connected to the electrode pad, the conductive bump being electrically connected to a driving integrated circuit (IC) that applies a predetermined signal to the electrode pad by using a non-conductive resin.

2. The thin film transistor substrate of claim 1, wherein the protrusion member is disposed on the electrode pad such that a peripheral portion of the electrode pad is exposed.

3. The thin film transistor substrate of claim 2, wherein the protrusion member comprises an embossing pattern on an upper surface thereof.

4. The thin film transistor substrate of claim 1, wherein the protrusion member comprises a plurality of projections spaced apart by a predetermined distance, a portion of the electrode pad being exposed through a space between the projections.

5. A method of manufacturing a thin film transistor substrate, the method comprising:

forming a gate line, a data line and a plurality of electrode pads disposed on end portions of the gate and data lines; and

forming a conductive bump including a protrusion member disposed on the electrode pads to have a predetermined thickness and a conductive coating layer disposed on the protrusion member to be electrically connected to the electrode pad, the conductive bump electrically connected to a driving IC that applies a predetermined signal to the electrode pad by using a non-conductive resin.

6. The method of claim 5, wherein the conductive bump is formed by:

forming a photoresist organic layer on the electrode pad;

patterning the photoresist organic layer to form a protrusion member on the electrode pad;

forming a conductive layer covering the protrusion member; and

patterning the conductive layer to form a conductive coating layer on the protrusion member, the conductive coating layer being electrically connected to the electrode pads.

7. A liquid crystal display (LCD) apparatus including a pixel region having a plurality of thin film transistors (TFT) and conductive lines connected to the thin film transistors, and including a pad region having a plurality of electrode pads, the LCD apparatus comprising:

an LCD panel including a TFT substrate, a color filter substrate corresponding to the TFT substrate, and a liquid crystal layer interposed between the TFT substrate and the color filter substrate, the TFT substrate including a protrusion member disposed on the electrode pad and a conductive bump disposed on the protrusion member, the conductive bump having a conductive coating layer that is electrically connected to the electrode pad;

a driving integrated circuit (IC) electrically connected to the conductive bump to apply a predetermined signal to the electrode pad; and

an adhering member disposed between the conductive bump and the driving IC, the adhering member adhering the driving IC to the conductive bump to ensure an electrical connection between the conductive bump and the driving IC.

8. The liquid crystal display apparatus of claim 7, wherein the protrusion member comprises an elastic organic material so that the conductive bump is compressed by a distance when the driving IC is pressed down and is restored corresponding to the distance when the driving IC is released, thereby maintaining an electrical connection between the conductive bump and the driving IC.

9. The liquid crystal display apparatus of claim 8, wherein the protrusion member is disposed on the electrode pad such that a peripheral portion of the electrode pad is exposed.

10. The liquid crystal display apparatus of claim 9, wherein the protrusion member comprises an embossed pattern on an upper surface thereof.

11. The liquid crystal display apparatus of claim 8, wherein the protrusion member comprises a plurality of projections spaced apart by a predetermined distance, a portion of the electrode pad being exposed through a space between the projections.

12. The liquid crystal display apparatus of claim 7, wherein the adhering member comprises a non-conductive resin that is softened during a thermal compression process on the driving IC and has gradually hardened from the time when the thermal compression process is completed, so that the driving IC is adhered to the conductive bump by a contraction of the non-conductive resin due to

a hardening thereof.

13. A method of manufacturing a liquid crystal display apparatus including a pixel region having a plurality of thin film transistors (TFT) and conductive lines connected to the thin film transistors, and including a pad region having a plurality of electrode pads, the LCD apparatus comprising:

forming a TFT substrate including a protrusion member formed on the electrode pad and a conductive bump formed on the protrusion member, the conductive bump having a conductive coating layer that is electrically connected to the electrode pad;

forming a color filter substrate oppositely combined with the TFT substrate ;

forming a liquid crystal layer between the TFT substrate and the color filter substrate; and

connecting a driving integrated circuit (IC) to the conductive bump electrically by using an adhering member, the driving IC applying a predetermined signal to the electrode pad.

14. The method of claim 13, the TFT substrate is formed by:

forming a photoresist organic layer in the pixel and pad regions;

patterning the photoresist organic layer to form an insulating layer in the pixel region and a protrusion member in the pad region, the insulating layer protecting the plurality of TFTs and the conductive lines, the protrusion member being formed on the electrode pad;

forming a conductive layer over the insulating layer and the protrusion member; and

patterning the conductive layer to form a pixel electrode on the insulating layer and a conductive coating layer on the protrusion member electrically

connected to the electrode pad.

15. The method of claim 14, wherein the conductive layer comprises indium tin oxide (ITO) or indium zinc oxide (IZO).

16. The method of claim 14, wherein the conductive layer comprises metal.

17. The method of claim 14, wherein the conductive layer comprises a stacked layer having first and second layers, the first layer including ITO or IZO and the second layer including metal.

18. The method of claim 13, wherein the adhering member comprises a non-conductive resin that is softened during a thermal compression process on the driving IC and has gradually hardened from the time when the thermal compression process is completed, so that the driving IC is adhered to the conductive bump by a contraction of the non-conductive resin due to a hardening thereof.